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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,968	04/15/2004	Alexander T. Garthwaite	33226/980001; P8304	7446
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OSHA LIANG L.L.P./SUN 1221 MCKINNEY, SUITE 2800 HOUSTON, TX 77010			EXAMINER HOFFLER, RAHEEM	
			ART UNIT 2165	PAPER NUMBER
			MAIL DATE 06/22/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/824,968

Applicant(s)

GARTHWAITE, ALEXANDER T.

Examiner

Raheem Hoffer

Art Unit

2165

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 41-57 is/are pending in the application.
- 4a) Of the above claim(s) 1-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 41-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Detailed Action

Examiner Remarks

As a result of Applicant's Revocation and Substitute of Power of Attorney, Claims 1-40 have been cancelled and replaced with new Claims 41-57. Rejections under 35 USC 112 have been withdrawn. Accordingly, this action has been made FINAL.

Claim Objections

Claims 54 & 55 are objected to because of the following informalities: Both Claims 54 & 55 are identical claims. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 41-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steensgaard et al (US PG Pub No. 20020095453A1) in view of Lewis et al (US PG Pub No. 20050015417A1).

As for Claim 41, Steensgaard et al teaches, "obtaining a collection set of objects in a computer system, wherein the collection set is associated with a collector interval of a collection cycle"; "partitioning the collection set of objects into a plurality of sections, wherein a section of the plurality of sections is associated with a remembered set";

"partitioning the section into a plurality of segments" (see paragraph [0011], [0072-0074]); "identifying a first plurality of references to objects in the first segment using the remembered set" (see paragraph [0027-0028]); "incrementing the first entry based on a size of the first plurality of references" (see paragraph [0029], [0034]); "and evacuating a first object from the first segment based on the first comparison to reclaim memory of the computer system for reuse" (see paragraph [0069] and [0075-0077]). Steensgaard et al fails to teach obtaining a first count-map for the section and comparing the first entry with a popular-object threshold to generate a first comparison. Lewis et al explicitly recites "obtaining a first count-map for the section, wherein the first count-map is associated with a first thread, and wherein a first entry in the first count-map is associated with a first segment of the plurality of segments" (see Fig. 1A/B; [0005], [0008], and [0031]); and "comparing the first entry with a popular-object threshold to generate a first comparison" (see paragraph [0063], [0068]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the teachings of object-reference counting within garbage collection as taught by Lewis et al with the garbage collection incorporating remembered sets taught by Steensgaard et al in order to reduce the number of objects sent to a garbage collector, while identifying the difference between garbage and non-garbage items depending upon a multitude of references to other objects.

As for Claim 42, Steensgaard et al teaches, "identifying a second plurality of referenced to objects in the first segment using the remembered set" (see paragraph [0027-0028]); and "incrementing the second entry based on a size of the second plurality of references" (see paragraph [0029], [0034]). Steensgaard et al failed to explicitly recite obtaining a second count-map for the section, and incrementing the first entry based on the second entry before comparing the first entry with the popular-object threshold. Lewis et al explicitly recites "obtaining a second count-map for the section, wherein the second count-map is associated with a second thread, and wherein a second entry in the second count-map is associated with the first segment" (see Fig. 1A/B; [0005], [0008], and [0031]); and "incrementing the first entry based on the second entry before comparing the first entry with the popular-object threshold" (see paragraph [0005], [0031], [0063], and [0068]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the teachings of object-reference counting within garbage collection as taught by Lewis et al with the garbage collection incorporating remembered sets taught by Steensgaard et al in order to reduce the number of objects sent to a garbage collector, while identifying the difference between garbage and non-garbage items depending upon a multitude of references to other objects.

As for Claim 43, Steensgaard et al teaches, "identifying a second plurality of references to objects in the second segment using the remembered set" (see paragraph

[0027-0028]); “incrementing the second entry based on a size of the second plurality of references” (see paragraph [0029], [0034]); “and evacuating a second object from the second segment based on the second comparison to reclaim memory of the computer system for reuse” (see paragraph [0069] and [0075-0077]). Steensgaard et al fails to explicitly recite obtaining a second count-map for the section and comparing the second entry with the popular-object threshold to generate a second comparison. Lewis et al explicitly recites “obtaining a second count-map for the section, wherein the second count-map is associated with a second thread, and wherein a second entry in the second count-map is associated with a second segment of the plurality of segments” (see Fig. 1A/B; [0005], [0008], and [0031]) and “comparing the second entry with the popular-object threshold to generate a second comparison” (see paragraph [0063], [0068]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the teachings of object-reference counting within garbage collection as taught by Lewis et al with the garbage collection incorporating remembered sets taught by Steensgaard et al in order to reduce the number of objects sent to a garbage collector, while identifying the difference between garbage and non-garbage items depending upon a multitude of references to other objects.

As for Claim 44, Steensgaard et al teaches, “adding a new section to the plurality of sections and placing the first object in the new section, wherein the new section is

exclusively occupied by the first object" (see paragraph [0066], [0069]).

As for Claim 45, Steensgaard et al teaches, "adding a new section to the plurality of sections and placing the second object in the new section, wherein the new section is exclusively occupied by the second object" (see paragraph [0066], [0069]).

As for Claim 46, Lewis et al teaches, "the popular-object threshold is an individual-map threshold" (see paragraph [0005], [0031], [0063], and [0068]).

As for Claim 47, Lewis et al teaches, "the popular-object threshold is a multiple-map threshold" (see paragraph [0005], [0008], and [0031]).

As for Claim 48, Steensgaard et al teaches, "at least one of the plurality of segments is smaller than a minimum object size" (see paragraph [0011], [0027]). The teachings of Steensgaard et al suggest that the memory manager embodies an allocation module and a heap memory that would be responsible for imposing a minimum object size, as illustrated in applicant's claim language.

Claims 49-56 differ from Claims 41-48 in that claims 49-56 are computer readable medium whereas claims 41-48 are method claims. Thus, claims 49-56 are

analyzed as previously discussed with respect to claims 41-48 above.

Claim 57 differs from Claims 41 & 49 in that claim 57 is an apparatus whereas claim 41 is a method claim and claim 49 is a computer readable medium claim. Thus, claim 57 is analyzed as previously discussed with respect to claims 41 & 49 above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raheem Hoffler whose telephone number is (571) 270-1036. The examiner can normally be reached on 7:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery Gaffin can be reached on (571) 272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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RH



Raheem Hoffler



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PRIMARY EXAMINER